

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Calculus I (Non-engineering)
COURSE NUMBER	MATH 0120
DIVISION	Math, Science, Business & Technology
DEPARTMENT	Mathematics
CIP CODE	24.0101
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3
PREREQUISITES	Earn a grade of "C" or better in MATH0105/106 College Algebra (w/wo review) or MATH0108 Precalculus OR with consent of a fulltime Calculus instructor.

COURSE PLACEMENT Students must meet the correct placement measure for this course. Information may be found at:
<https://www.kckcc.edu/admissions/information/mandatory-evaluation-placement.html>

COURSE DESCRIPTION

Calculus I is designed for students in business, life science, or social science. Content includes the study of the derivative and anti-derivative and their applications as applied to algebraic, exponential, and logarithmic functions. Students will be expected to use appropriate technology as one tool to achieve competency in Calculus I.

KANSAS SYSTEMWIDE TRANSFER: MAT1050

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

GENERAL EDUCATION LEARNING OUTCOME

- Basic Skills for Communication
- Mathematics
- Humanities
- Natural and Physical Sciences
- Social and Behavioral Sciences

INSTITUTIONAL LEARNING OUTCOMES

- Communication

- Computation and Financial Literacy
- Critical Reasoning
- Technology and Information Literacy
- Community and Civic Responsibility
- Personal and Interpersonal Skills

TEXTBOOKS

<http://kckccbookstore.com/>

METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Analysis of Linear and Non-linear Functions
 - A. Linear
 - B. Quadratic
 - C. Exponential
 - D. Behavior
 1. Limits
 2. Continuity
 - E. Modeling functions
- II. Rate of change for Derivatives
 - A. Percentage change
 - B. Average rate of change
 - C. Rules for finding the derivative
 - D. Derivative at a point
- III. Change and Applications of Derivatives
 - A. Optimization
 - B. Inflection points
 - C. Curve sketching
 - D. Mathematical models
- IV. Accumulated change in Integrals
 - A. Interpretation of area
 - B. Approximation of area
 - C. Interpretation of definite integrals
 - D. Calculation of definite integrals
 - E. Fundamental Theorem of Calculus
 - F. Anti-derivatives

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. evaluate limits of functions.
- B. use limits to determine continuity of a function at a point.
- C. determine differentiability of a function at a point.
- D. differentiate algebraic, exponential, and logarithmic functions.
- E. interpret derivatives as the slopes of tangent lines, instantaneous rates of change, and marginal values.
- F. use derivatives to describe the behavior of a function.
- G. apply derivatives to problems in economics, business, and the physical, social, and life sciences.
- H. antidifferentiate algebraic and exponential functions.
- I. evaluate definite integrals.
- J. apply antiderivatives to problems in economics, business, and the physical, social, and life sciences.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.